Subject: Fire Cove dive survey.

Results:

Site: Neets Bay 8; (Fire Cove)	
Date Surveyed: 5/22/97	Total # of Sample Points: 33
Time of Sampling: 1210	Average Bark Depth: 20.9 cm
Sampler: C. Sempert	Calculated Survey Area: 0.39 acres

Area with Debris Cover	Area with 100 % Cover	Area with 100 % Cover & Debris Depth ≥10 cm
0.39 acres	0.31 acres	0.21 acres

The permanent reference point was positioned on the fill rocks in the middle of the small bulkhead directly below the A-frame at a depth estimated to be close to zero feet MLLW. Actual corrected depth of the reference point was +4 feet MLLW. A total of 33 sample points were taken on the five transects and all sample points had at least a trace of debris present. Of these, 18 had a measured debris depth of 10 centimeters or greater and 100% cover. A total of 26 sample points had an estimated 100% coverage. Surface area covered by bark debris in the survey, using transects 330 and 090 as boundaries, computes to 0.39 acres which is the same as the area covered by the survey.

Observations:

Weather conditions at survey time were partly cloudy skies with wind out of the northwest at 10 knots. The diving started at 1135 and took place during a high slack tide period. High tide occurred at 1302 with a height of 15.0 feet (corrected to subordinate station #1427, Traitors Cove (lower), and based on the Ketchikan tide tables) and a tidal exchange of 13.1 feet. No noticeable current was experienced during the survey. Water temperature was measured at 46 degrees, underwater visibility was estimated at a remarkably clear 50 -75 feet.

The LTF was no longer operational at the survey time. The site is located near the head of Neets bay on the south shore. The shoreline is mostly rocky which continues down to a depth of about the lowest minus tide. The substrate then turns to sand and slopes pretty steeply to depths deeper than the maximum survey depth. In the area of transects 330 to 030 the bottom topography is a steep slope from the intertidal zone to deep water with fill rocks and boulders

from the bulkhead only in the vicinity of the reference point. A few rocks, boulders and bedrock knobs interrupt the smooth features of slope on transect 330. Transects 060 & 090 cross a shelf-like area before dropping relatively steeply down the smooth bedrock face of a ridge and then meeting the steady slope of the area.

Bark debris was fairly uniform in size and distribution throughout the sample area. Size is characterized as barkdust - fine to small bark particles. Occasional larger chips, chunks and branches were present in varying concentrations but the overall coverage was unusually homogenous in its small size. A large sunken log lay across transect 090 (see photograph #17)

Due to the nearly complete bark cover over nearly the entire survey area, the observed marine life was limited to organisms that can inhabit the surface of the debris. The fill rock in the vicinity of the reference point remains unencrusted by life - it appears that the rock is unstable and has moved or disturbed too much to be colonized. A few crabs of several different species were observed along all transects. A small Dungeness crab was observed buried in the bark debris along transect 090. Sea cucumbers were present in low numbers as were sea stars. Some of the bark debris surface appears to have light, patchy bacterial growth which might indicate lack of disturbance and low current flow.

A truck, which appears to have been underwater for some time, was the only notable manmade debris object and is located near sample point 030/5. Towards the end of transect 330 there were a few small engine/machine parts scattered about. The usual dog stake lines were present in the bundles which fell off the boom boats and a few scattered swifter coils remained from the operation.

Conclusion:

Though baseline survey data was not available, the surveys over the past two years give us the observational experience to believe that the measurements have a high degree of accuracy. The substrate type and topographical features of the site are favorable to collecting survey data.

The depth of bark accumulation over nearly the entire survey area is significant enough to cause a shift from a benthic filter feeding community to that of detrital feeding organisms.

Table 1

Transect Location

Transect	Reference Point Location
330 000 030 060 090	At the center of the log bulkhead and on the fill rock directly under the A-frame, out a distance of about eight feet. Actual measured depth 10 feet, corrected to MLLW depth of +4 feet.

Table 2

Transect Data

Transect/ Sample Pt.	Depth from MLLW	Debris Depth (cm)	Percent Coverage
Ref. Pt.	+4	<3	10
330/1	3	5	90
330/2	13	58	100
330/3	28	28	100
330/4	38	15	100
330/5	52	8	100
000/1	4	2	100
000/2	14	36	100
000/3	28	46	100
000/4	42	36	100
000/5	53	15	100

Table 2 (cont.)

Transect/ Sample Pt.	Depth from MLLW	Debris Depth (cm)	Percent Coverage
030/1	5	<3	25
030/2	12	71	100
030/3	27	76	100
030/4	41	46	100
030/5	53	20	100
060/1	7	2	75
060/2	19	5	100
060/3	24	20	100
060/4	27	<3	90
060/5	41	<3	50
060/6	47	8	100
060/7	52	5	100
090/1	7	3	100
090/2	12	33	100
090/3	15	5	75
090/4	19	41	100
090/5	23	28	100
090/6	26	20	100
090/7	30	13	100
090/8	34	8	100
090/9	39	10	100
090/10	45	8	100
090/11	49	5	100

□ Sample point - No debris

○ Sample point - Debris present

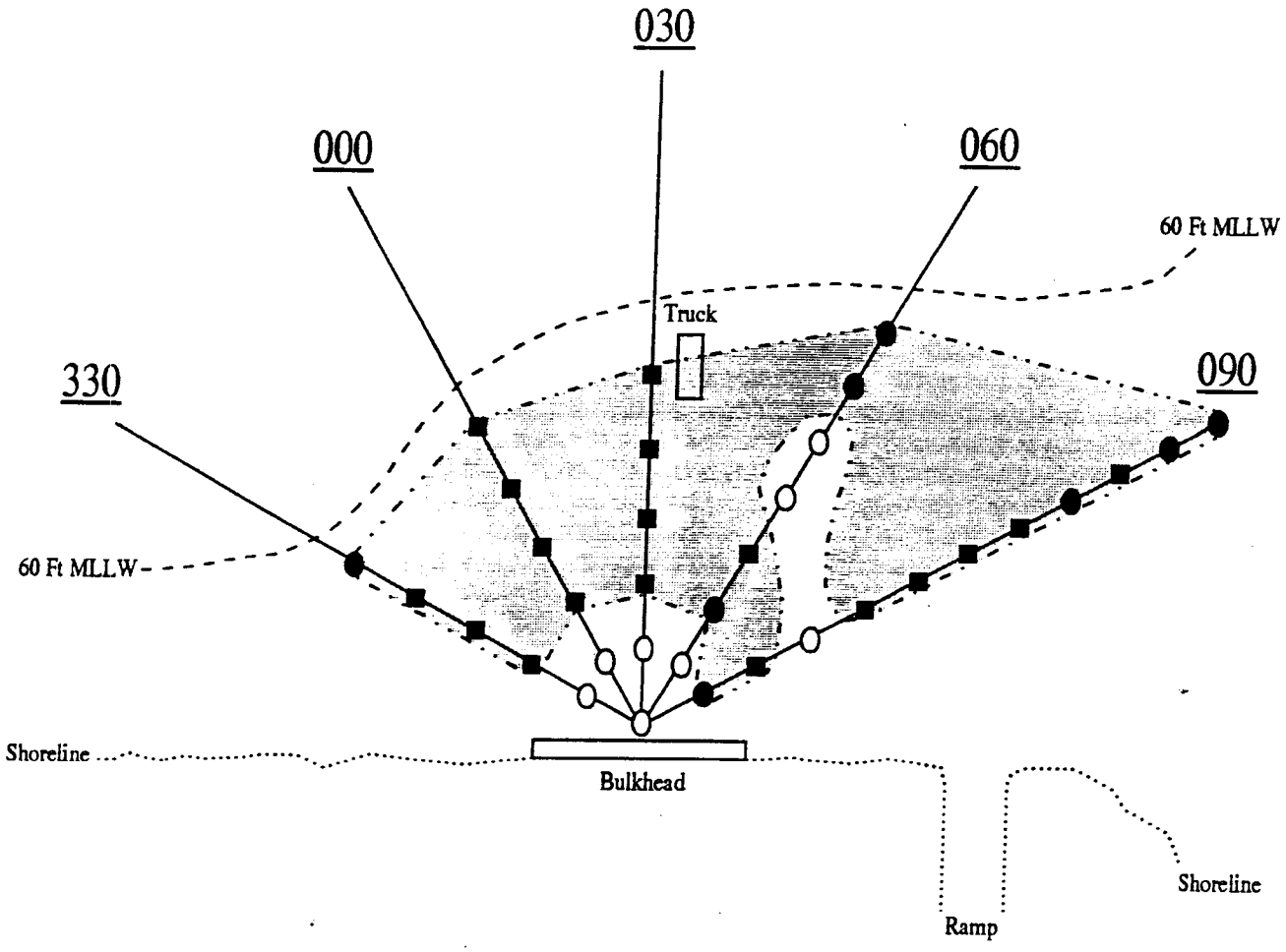
● Sample point - Debris with 100 % coverage

■ Sample point - Debris depth ≥ 10 cm, 100 % coverage

Not to Scale

Sample Point Interval = 5 m

Area of 100 % Cover



5/22/97 Fire Cove Bark Debris Survey

Table 3

Photograph Key

Photo #	Transect/ Sample Pt.	Description
1	Ref. Pt.	No encrusting growth in high energy zone
2	330/1	Large and fine debris particles
3	330/2	Zone of very fine debris
4	330/3	Continued fine, deep debris
5	330/4	Small flatfish on debris
6	330/5	Rope, branch and silt on debris
7	030/1	Wire end and algae film on debris; rocks
8	030/2	Complete bark cover with bacteria patches
9	030/3	Larger bark debris pieces
10	030/4	Fine bacterial film on 100% debris
11	030/5	Sea cucumber and branch on debris
12	090/1	Swifter coil on thin debris layer
13	090/2	Algae and bacterial film on fine debris
14	090/3	Old wire; rocks visible
15	090/4	Uniform layer of bark debris
16	090/5	Fairly uniform debris
17	090/6	Sunken log with Bankia sp. feces